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## INDIVIDUAL MEMORIES.

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This paper comprises one of nine chapters which treat of memory or memories. The preceding sections contain (a) An Historical Orientation; (b) A Biological Orientation which treats of racial memory and traces the individual psychical memory through different stages of life from man down to the vorticellæ; (c) The Diseases of the Memory—an original study based upon new material; (d) The Relations of Brain to Mind; (e) Memories. The subsequent chapters treat of Apperception and Association, Attention and Interest, and the final chapter is a summary of the leading pedagogical principles suggested throughout the work. The purpose of this paper is to give the results of a study of the memories of normal people from nine months to ninety years of age.

At the outset a real difficulty is met which is well illustrated in the following extract from "Recollections of Childhood," by Sonya Kovalévski. She writes: "When I begin to sort out and classify my earliest recollections, the same thing always happens with me: these recollections disperse before me. At times it seems to me that I have found the first definite impression which has left a distinct trace in my memory; but as soon as I concentrate my thought on it for a while, other impressions of a still more remote period begin to peep forth and acquire form. And the difficulty of it is that I cannot myself in the least determine which of these impressions I really remember; that is to say, I cannot decide which of them I really lived through and which of them I only heard about later on,—in my childhood—and imagine that I recall, when, in reality, I only remember the accounts of them. Worse still I can never succeed in evoking a single one of these original recollections in all its purity; I involuntarily add to it something foreign during the very process of recalling it." She then describes a scene in childhood, and adds: "As I reflect upon the matter now, I think I must have been two or three years old, and that the scene took place in Moscow where I was born." After the first memory she recalls "a series of detached but tolerably clear pictures" as of "picking up pebbles," and "my sister's doll which I threw out of the carriage window."

So many people have had the experience described by this "marvel of mental development" that the question may fairly be asked—can most people ascertain their earliest memories with sufficient accuracy and certainty to render them trustworthy data for scientific results? In order to test whether the difficulty would prove insuperable, one hundred persons were personally interviewed, most of whom were more than sixty-five years of age. The results of these interviews were such as to lead to the belief that after all deductions are made there is a large residuum which is reliable. Moreover the very difficulty alluded to is explained, at least in part, by the hypothesis advanced later in this study. The questionnaire read as follows:

1. What is your earliest memory? However trivial, or childish, your earliest experience is wanted. Be sure that it is a memory and that no one has told you.
  - In 1, 2, 3, give your age at the time, at least the probable age.
  2. In like manner, give your second and third earliest memories.
  3. What is your earliest recollection of your (a) father, (b) mother, (c) sister, (d) brother, (e) playmates, (f) of any injury from a fall or a blow?
  4. Of what four consecutive years have you the best recollection?
  5. Of what four consecutive years, after the first four have you the poorest memory?
  6. Can you state examples of false memories experienced? *e. g.* Have you recalled as real what you had merely dreamed, heard or read? Give, if possible, a case of transposed memory in which what happened earlier was recalled later, and what happened later was recalled earlier.
  7. What book read before you were nine years of age do you recall best?
  8. Do you recall pleasant or unpleasant experiences better?
  9. What studies have best developed your memory?
  10. Give a condensed account of any case of loss of memory caused by a blow on the head, a fall or by disease.
  11. Describe fully any aids to memory which you have found useful. How do you fix in mind and recall (a) figures, dates, dimensions, (b) forms of faces, microscopic structures, leaves, crystals, patterns, figures on the wall, carpet or dress, phrases in music and the cut of dresses? (c). How do you fix and recall passages of prose and poetry, declamations, and recitations? Why and how do you memorize fine passages? In learning foreign languages, describe devices for fixing new forms and phrases. Describe your system of keeping appointments. What memorandum do you keep, what book is used and how do you make entries? As a student, how full notes do you take in the class room? How would you teach a boy to remember things on time? Do you store up facts and dates, with no definite idea of how you will use them?
  12. State cases in which the memory is so good or bad, that it weakens the other powers of the mind.
  13. Describe cases of exceptional forgetfulness in old and young, stating whether it was due to distraction, abstraction, loss of mental power, or heredity.
- As a rule, does defect in memory in children appear in the field of things done, known or felt?

14. As you advance in years do you find the interval between the power to determine whether you have had an experience and the ability to define, locate and name the experience wider or narrower? How is this in the kindergarten, high school, college, middle life, and old age?

The tabulation required almost incessant labor for five months. The results were first tabulated<sup>1</sup> upon two rolls of paper whose combined length was fifty-two feet by one foot eight inches in breadth. A second tabulation was made in which the memories (which could be readily studied from the first tabulation) were arranged under a large number of headings (over sixty), these headings being drawn from the papers themselves. Such topics were used as novel occurrences, repeated or protracted occurrences, gustatory memories, auditory memories, memories of father, mother, brothers, sisters, more distant relatives, other persons, deaths and funerals, sickness and accidents to self, sickness and accidents to others, memories of time, number, etc. Under novel occurrences or single impressions were included such memories as, seeing the ocean for the first time, drowning a cat, pet bird died, etc. By protracted or repeated experiences were included such memories as bringing water for mother in a little pail, the dress a person wore, etc.

To this topical syllabus 1,658 replies were received in time for tabulation. Of this number 1,372 were from white people; 605 males and 767 females. 182 were from negroes; 94 males and 88 females. 104 returns were furnished by Indians; 64 males and 40 females. The Indians represented 25 different tribes. The tabulations were made according to age in periods as follows: I, ages 1-4; II, ages 5-9; III, ages 10-11; IV, ages 12-13; V, ages 14-15; VI, ages 16-17; VII, ages 18-19; VIII, ages 20-29; IX, 30-39, etc. The last decade was practically 80-89, although a few males and one female 90 years of age sent returns, which were tabulated separately. The purpose in tabulating two year periods from 10-20 was to note the changes in memory, if any occurred, during this period of growth. The returns furnished many memories besides the first three. While the whole number of early memories did not differ essentially in character from the first three, the former furnish broader data for safe conclusions.

The youngest child whose memory was obtained was eleven months of age. She had apparently two definite memories. These experiences may not enter into the list of permanent memories. Yet a few adults state that they remember expe-

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<sup>1</sup> I am indebted to my wife for the painstaking tabulations.

riences as early as one year of age,<sup>1</sup> and no definite limit can be set for the age of the earliest memories. The earliest memories of children under five years of age show the following range: The first number mentioned in each group of two representing males, and the second number females.

Novel occurrences or single impressions: fifteen, thirty-one; Protracted or repeated occurrences: sixteen, nine; Visual memories: twelve, sixteen; Auditory: four, two; Emotional: one, one; Gustatory: —, three; Motor: eight, nine; Tactile: one, two; Father: two, three; Mother: five, one; Grandparents: one, —; Brothers and sisters: two, one; Playmates: four, one; Other persons: three, two; Temperature: one, —; Topographical: seven, two; Logical: six, —; Clothing: five, one; School: —, two; Home: —, one; Visitors: —, two; Visiting: —, one; Running away: —, one; Corporal punishment: —, one; Dolls: one, nine; Sickness and accidents to self: five, three; Sickness and accidents to others: one, —; Deaths and funerals: one, —; Domestic fowls and animals: two, three; Fright: one, one; Colors: three, five; Playthings: four, four; Gifts: two, seven, Christmas: one, six; Playing: one, two; Activity of others: one; three; Attendant circumstances: one, —; Intellectual: one, —; Physical pain: one, —; Number: —, one; Trees: —, two; Mechanical: one, —; Teasing others: one, —; Time: one, —; Where slept: one, —.

It will be seen that the males have the greatest number of memories for protracted or repeated occurrences, for people and clothing. They excel also in topographical and logical memories. The females have the better memory for novel occurrences and single impressions, for Christmas, gifts, and, as would be expected, for dolls.

In the 5-9 period, the males again excel in the memory for protracted and repeated occurrences, the females for novel occurrences or single impressions. The motor memories here have a marked increase in the case of the females, and a slight increase for the males. The memory for all persons shows a noticeable increase with the females. For the males the personal memory improves for near relatives only. In the case of each there is a better memory for the activity of others.

In the next period—age 10 and 11—motor memories decrease for the females and increase for the males. Memories of near relatives increase in the case of both, while memories for other persons decrease. Memories of sickness and accidents to self and of playing are emphasized.

In the 12-13 period the percentage of memories for novel oc-

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<sup>1</sup>This accords with the researches of V. and C. Henri. See popular Science Monthly for May.

currences decreases in the case of the females, while those for protracted experiences increase. Both males and females show a decrease in memories for near relatives, and an increase in those for playmates and other persons. Sickness and accidents to self are remembered less by males and better by females than in the preceding period. Memory for the activity of others increases in the case of the males and decreases in the case of the females.

In the period which includes those fourteen and fifteen years of age it is worthy of note that the motor memories nearly culminate for the males, but decrease in the case of the females. These memories seem to harmonize with the psychical and physical life of the period. Mischievousness and destructiveness are well remembered. The males have a decrease in the proportion of memories of novel occurrences and an increase in those for repeated occurrences. The reverse is true in the case of females. The males show a marked decrease in memories for relatives and playmates and an increase in those for other persons. Topographical memories increase in the case of each, as do visual and auditory memories.

In the period 16-17 the relations are again reversed so far as novel occurrences and protracted experiences are concerned, the females showing an increase in memories for the latter and a decrease for the former. In the case of the males the opposite is true, and the percentages become essentially the same as in the period 12-13. The females show a slight increase in memory for all near relatives and playmates, and a greater increase in memory for other persons. The males show an increase in memories for playmates and relatives, and a decrease in memories for other persons. The females have a marked increase in the memory for fears, the males for the activity of others.

In the period 18-19 there is an increase in the visual memories for each sex, and the auditory memory of the females improves. The memory for the activity of others shows an increase in the case of each, and it is strongly emphasized for the males. The females excel in the proportion of memories for protracted or repeated occurrences, and the males in that for novel occurrences and single impressions.

Dr. G. Stanley Hall and Drs. Lancaster, Starbuck and others, have found that puberty exerts a great influence upon the entire psychical life. In order to test its effect upon memory the exact pubertal age was obtained by Miss Williams of 110 females who had answered my questionnaire. Of the 110 cases, in 37 puberty occurs in the period of best memory; in 9 it occurs in the period of poorest memory; in 50 it occurs between the periods of best and poorest memory; in 14 it occurs

after the periods of both best and poorest memory. In 16 cases it occurs at the beginning of the best remembered period. In 4 cases it occurs at the close of the best remembered period. In 5 cases it marks the division between the best and poorest memory. In two others it occurs at the close of the period of poorest memory.

The returns give evidence that the period of adolescence is one of great psychical awakening. A wide range of memories are found at this time. From the fourteenth year with girls and the fifteenth with boys, the auditory memories are strongly developed. At the dawn of adolescence the motor memory of boys nearly culminates, and they have fewer memories of sickness and accidents to self. During this time the memory of others persons and the activity of others is emphasized in case of both boys and girls. In general at this period the special sensory memories are numerous, and it is the golden age for motor memories. Now, too, the memories of high ideals, self sacrifice and self forgetfulness are cherished. Wider interests than self and immediate friends become the objects of reflection and recollection.

The decade 20-29 is perhaps to most people as important a decade as any. At this period there is a marked change in the memory content. For the second time the proportion of memories for novel occurrences and for protracted or repeated experiences is nearly the same in the case of males and females. The males show a noticeable increase, and the females a marked decrease in visual memories. The same is true of the auditory memories. The memory for grandparents nearly culminates in the case of the females, and increases in the case of the males. The females show an increase in logical memories, and a more decided increase in topographical memories than do the males. Memories of sickness and accidents to self decrease with the males and increase with the females, while in the case of both there is relative decline in the memories of sickness and accidents to others.

In the decade 30-39 memories involving reflection and thought seemingly ripen. The logical, intellectual, topographical and visual memories for the males culminate here, also those for time, number, colors and father. The visual and auditory memories of the females culminate, while the intellectual, logical and topographical nearly reach the zenith. Memories for joy, quarrels, pride, jealousy, Christmas, physical pain and weariness disappear. The predominant memories are of a thoughtful cast. This is a conservative period, as no new memories are introduced.

In the decade 40-49 memories for persons tend to fall away. One is almost surprised to find the motor memories of the

females ascend and reach their maximum. Their tactile memories also advance and culminate in the next period.

In the decade 50-59 the motor memories of the males culminate and again appear strong from 80 to 89. We have seen that they nearly reach their maximum at 14, and in all subsequent periods they are well represented. According to Ribot the motor elements are primary in all emotions, and they seem to be among the most abiding of memories. The memory of the males for physical pain and weariness culminates from 60 to 69; that of both males and females for school culminates from 70 to 79; and that of the males for wearing dresses from 80 to 90. The boy's first trousers are remembered best in the first and last periods of his life. In the last decade the chief classifications are still represented, but it is noticeable that the auditory and tactile memories entirely disappear in this period. Memories are no longer found for grandparents, sickness and accidents to self, gifts and Christmas. On the other hand visual memories and those for near relatives are well represented.

As already stated in the replies to the questions calling for the first three memories, a much larger number than three was frequently given. Moreover other questions called for earliest memories of relatives, playmates, etc., so that a much larger number of memories was obtained than the first three of each individual. White persons reported, as the second tabulation shows, 6,222 memories, 78 per cent. of which were novel occurrences or single impressions, and 22 per cent. protracted or repeated experiences. The males had  $76\frac{2}{3}$  per cent. memories for novel occurrences, and  $23\frac{1}{3}$  per cent. for repeated impressions. With them the memory for novel occurrences culminates in period VII, ages 18 and 19, when they constitute  $83\frac{3}{5}$  per cent. of all memories. With females the memory for novel occurrences culminates in period III, ages 10 and 11, when they constitute 89 per cent. of all memories. They drop to  $58\frac{3}{5}$  per cent. with the males during the two periods 70-79 and 80-89, but rise at 90 to  $84\frac{3}{5}$  per cent. With the females they also drop to  $58\frac{7}{10}$  per cent. in the period 80-89.

The memories of repeated occurrences in the case of the males culminate in the first period (ages 1-4), when they constitute  $51\frac{3}{5}$  per cent. of the memories. They become  $35\frac{2}{5}$  per cent. in period X, ages 40-49. With the females they are  $22\frac{1}{2}$  per cent. in the first period, ages 1-4, and do not form a greater proportion except during three periods: VII, ages 18 and 19, when they are  $27\frac{3}{5}$  per cent., XI, ages 50-59, and XIV, ages 80-90, when they become  $31\frac{9}{10}$  and  $41\frac{3}{10}$  per cent., respectively, of the whole.

The fact that different memories culminate at different periods

may be significant. In not a few instances they seem to bear a relation to the whole mental life of the period. In order to determine this relation more definitely we shall now consider the periods when the memories more frequently found become a chief factor and reach their highest percentage. The visual memories are  $27\frac{1}{3}$  per cent. of the whole for the males, and 31 per cent. for the females. In the case of each they are a large factor in the first period, 1-4, when the child is exploring the world. With both males and females they culminate in the fourth decade, 30-39. In this period observation is ripened. In the case of the males the percentage is low in the 8th and 9th decades—70-89, and improves in the tenth, as if second sight were obtained. The auditory memories become accentuated with the males in period VI, years 16 and 17, and culminate in years 20-29. With the females they become emphasized in period V, years 14 and 15, and culminate in years 30-39. The periods of culmination are epochs when the auditory sense is much used as a rule. Men and women are busy, "hear what is going on," and do not spend much time in reading. It is worthy of note that in the period 80-89 for females and the 90 period for males, an age when the hearing is poor, there are no auditory memories. The motor memories come in great profusion at 14 and 15 for the males. At this period the motor memory is intensely motor, of a break bone and accident nature. On the other hand with the females at this period there is an actual falling off of 4 per cent. in motor memories. The motor memories, however, in case of the males, culminate in years 50-59 by a margin of  $3\frac{1}{2}$  per cent. over the 14 and 15 period, and with the females reach their maximum at 40-49. This may not easily be explained, but it is a period of life when activities have fallen away little, if any, and achievement and the results of activity are the objects of reflection.

The memories of brothers, sisters and playmates, culminate in the seventh period for females, and in the eighth for males, and then steadily diminish until second childhood begins. The memory of females for the mother exceeds that of the males by  $4\frac{1}{4}$  per cent., while males have a better memory for the father than females. The memories of the males for their grandparents reach the highest points at (a) 5-9, (b) 30-39, (c) 60-69; those of the females at (a) 5-9, (b) 20-29, and (c) 50-59, the years (a) when they have most to do with their grandparents in their own home, (b) when their children are small and their own parents first become grandparents, (c) when they become grandparents themselves. The natural interval of ten years between the ages of males and females in the last two cases may be noted. Memories for deaths and funerals are recalled by the females almost equally well in the years from 60

to 90, and are not strongly marked before this time. Those of the males culminate at 90, but are very marked from 70 to 79. Is it not true that the memories of any period are in harmony with the general psychical life of that period, and do they not to a certain extent partake of its qualities? These facts suggest that what is remembered does not primarily constitute definite memories, but a memory complex. From this complex, at subsequent periods of life, those parts are selected out and made distinct which are en rapport with what may be termed the memory tone of the period; *e. g.*, if the period be one in which the auditory sense is much used, or be one of great logical activity, auditory or logical memories will be prominent. This hypothesis explains the cases of individuals in whom certain types of memory are pronounced. It also explains those cases in which persons assert that they cannot single out early memories. "It is all one mass," they say. Such minds are little given to reflection upon the distant past. They have not tried to separate the single elements of the complex. When they consent to reflect for a time, they are usually able to differentiate single elements and to arrange them in serial order. Yet what these elements are will differ with the age of the individual or with his memory tone. The memories for sickness and accidents to self culminate for the females in years 12 and 13, and for the males in years 14 and 15. Sickness and accidents of others are best recalled by the females in years 14 and 15; by the males in period 12 to 13. Females have the better memory for sickness and accidents to others. Males have the better memory for sickness and accidents to self. The activities of others are best recalled by both males and females in the closing periods of their lives.

In the general average for the whole life it is interesting to note that the females have a slightly higher percentage of visual, auditory, gustatory and tactile memories than the males. The gustatory memory is  $3\frac{7}{10}$  per cent. for the females, and culminates in the first period, while among the males it is  $2\frac{3}{4}$  per cent., and culminates in period 5-9. Memories for odors are very few, being  $\frac{1}{4}$  of one per cent. for the males, and  $\frac{1}{8}$  of one per cent. for the females. The males have two per cent. more logical memories. The females have from  $2\frac{1}{2}$  to 4 per cent. better memory for mother, playmates and other persons. They have  $7\frac{1}{2}$  per cent. better recollection of brothers and sisters, and 7 per cent. less of topographical memories than the males. Motor memories, father, grandparents, gifts, playthings and fears, are about equally recalled by each, but the females have double the memories for playing. The female memory for dolls is  $3\frac{2}{3}$  per cent., and culminates in the first period, years 1-4, when it is  $22\frac{1}{2}$  per cent. of all memories.

The male memory for clothing is 6 per cent., the females  $7\frac{1}{2}$  per cent. The males have 7 per cent. of school memories, the females  $5\frac{1}{2}$  per cent. The memories of the males for home are  $1\frac{1}{2}$  per cent., of the females  $\frac{9}{10}$  of one per cent. The males have nearly 8 per cent. of memories for domestic animals and fowls, which culminate in period 40-49; the females have only  $2\frac{1}{4}$  per cent. of such memories, which culminate in period 50-59. Time has  $2\frac{8}{10}$  of memories with each. Number memories are  $1\frac{1}{4}$  per cent. for the males, and a little less than one per cent. for the females. Memories of colors are  $4\frac{1}{4}$  per cent. for the females,  $3\frac{1}{3}$  per cent. for the males. The males have  $2\frac{2}{5}$  per cent. of memories of deaths and funerals; the females  $1\frac{1}{2}$  per cent. Memories of trees are  $1\frac{1}{4}$  per cent. with the females, and  $\frac{4}{5}$  of one per cent. with the males. The following memories should also be mentioned: Picture taken; pride; visit to dentist; quarrels; storms; money; jealousy; shame; lie; selfishness; curiosity; birthdays; being lost; deceit; stealing; picnics; circus; parades and soldiers; praise; temperature; visiting;  $4\frac{1}{4}$  per cent. for females,  $2\frac{1}{4}$ , males; visitors  $2\frac{1}{4}$  per cent. for females,  $1\frac{1}{4}$ , males; reproof, which is remembered  $\frac{1}{3}$  as well as corporal punishment; running away; mud pies; crying and grief; anger; attendant circumstances; fishing; swinging; hair; sliding; physical pain; fatigue; malice; losing things; being praised; enemy; birthday; laughed at; playing horse; imitation; where slept; destructiveness; being kissed; disobedience; church; wedding; surprise; jealousy; teasing; mischief; guilt; blood; charity; revenge; working; supernatural; love; sorrow. The last eight memories are found for the first time at senescence.

The average age for the three earliest memories at different periods under the age of 25 is shown by the curves here given. The continuation of the same curves during the remaining periods is described in Figs. 1 and 2. The three lower lines represent the early memory of the males, and the upper ones of the females. The heavy line represents the first memory; the broken line the second, and the dotted line the third memories. Distance to the right represents the age of the person reporting; distance upward indicates the age of the person at the time of the occurrence remembered. For the first memory during the entire period, it is less than three years. The first rise in the curve is naturally marked because it begins low at the age of one. It drops at  $4\frac{1}{2}$  and five for the first two memories, which may be due to some acquired ability to reflect upon the past. Children under this age have not been given to reflection, and it is very difficult to get them to bring forth the memories which later years will prove that they already possess. There is a rise in all of the curves at adolescence which is emphatic in the case of four of them. This shows that from the age of 13 to 15,

Fig. I.

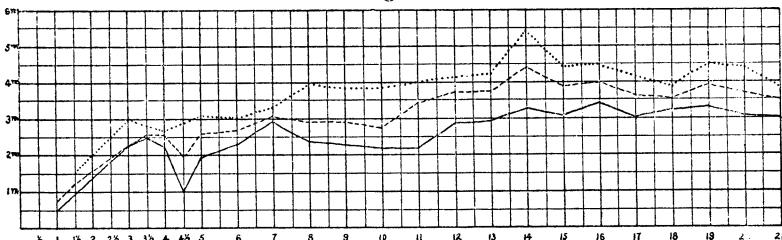
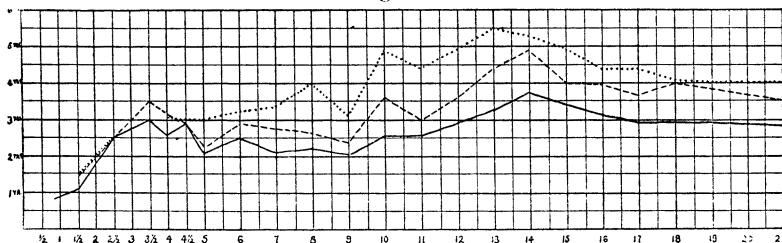


Fig. II.



boys and girls do not recall so early memories as others do before and after this period. At this period the present is large and the future makes a strong appeal. While the storehouse of memory is very rich now, perhaps the temperament or the psychical tone is now wanting in accordance with which painstaking reflection calls forth the earliest experiences. At any rate the earliest memories of boys at the age of 14 average almost four years, and for the girls it is more than three. At 35 the curve for the males descends and approaches two years, which is the average age for the first memory of boys at nine and five years of age. The curve for the earliest age of the females descends slightly at 30 and 40, and then fluctuates, rising slightly at 80 to descend again. The curve for the males rises at 70 and descends gradually, later terminating in the height reached at 6, 10 and 11.

The curves for the second and third memories call for no discussion as the representation is apparent. They show, however, a tendency to sympathize with the first. One fact seems clear from this study: There is not a progressive fading-out of memories as life advances and declines. The range of subjects recalled may narrow a little toward the close, but if a corresponding amount of data could be gathered, even this might be doubtful. The garrulous mode of talking prevalent among old people seems to be due to complete associations in which few petty details are omitted. Moreover the memory of the aged goes back practically as far as does that of young people, and is as clear and vivid. On the farm at my early home is a trout stream whose waters are clear and cold. In

childhood I saw the tree-tops and mosses mirrored in the clear waters. The stream has narrowed down a little owing to the cutting away of the forest. The branches now reflected there have changed somewhat, not by time, but by elements at work in time. If in old age I see them, the branches may be the same, but changed a little more. Such is the memory stream, narrowed a little, it may be, in the passing years, but the waters flowing as clear as ever from the same springs, mirror the old experiences.

Comparing the Indian males with the white males of the same period, the Indians show a higher percentage of memories for hearing, taste, mother and playmates, crying and grief, corporal punishment, trees, quarrels, and almost double for domestic fowls and animals. They have a higher percentage of tactile memories, and a smaller per cent. for dress and persons not relatives. The following memories are wholly or chiefly Indian: Fishing, snakes, squirrels, negroes, hunting (bow and arrows), lakes and streams, and tobacco.

Comparing Indian females with white females of the same age, the Indians have a larger percentage of auditory, gustatory and motor memories, also for father, mother, playmates, fear and dolls; much greater for crying and grief, and double the percentage for domestic fowls and animals. They have a smaller percentage of memories for persons not related, dresses and other clothing, fewer topographical and logical memories, and less for sickness and accidents to self and others, and for the activity of others. The following memories belong wholly or chiefly to the Indians: Lakes, rivers, wolves, coons, owls, fishing, skating and negroes.

The Indians who sent returns represent 25 different tribes, and may be considered fairly representative. Some of the tribes are in a low state of civilization, but many came from families of wealth and culture. Many of these memories may be termed crystallized racial experiences, and the question arises whether the memory tone is not modified by atavistic tendencies. As will be seen later, their memories for pleasant and unpleasant occurrences savor of racial experiences. The curves for the first three memories of both males and females average higher than those of the whites. That for the earliest memory of the males fluctuates between three and four until the age of 21 is reached. At this point it drops below 3, rises from 21 to 22, drops again, and with the curve for the second memory reaches its lowest point at 26. The third memory for this period is high. The curve for the earliest memory of the females reaches its lowest point by a rapid descent at 25. The second and third memories average 4 and 5, respectively, and are liable to reach the age of nine.

The curves for age, of the negroes, at the time of the first three memories show a higher average than those for the whites. The earliest memory of the males is usually found between three and four. The curve representing it is lower than 3 at the ages of 14 and 15; it also descends to three at the ages of 23, 24 and 27. It is high from 16 to 18, and culminates at 22. The second earliest memory ranges from 4 to 6, but at the age of 14 drops below 4. The curve for the third earliest memory fluctuates from  $4\frac{1}{2}$  to 9. The curve representing the earliest memory of the negro females descends to 2 at the age of 25, and at this period the second earliest memory descends to 3. The curve for the first is higher at the age of 26, when it is 4+. The curve for the third memory is noticeably high during the period from 14 to 16. The first and second are high from 15 to 17. The curve for the third memory is high again from 19 to 25, when it descends. The curve for the second memory, like that for the first, falls at 22, and both reach a very low point at 25.

The negroes do not seem to differentiate the memories from the memory complex until late in life. This may be due to the poverty of the mental experience in early life. The memory tone is monotonous. Further evidence of this is a strong tendency to remember by comparison. Such an event occurred in "Garfield's or in Harrison's administration," or "after I went to school." But the best educated negroes, as would be expected, have sharply defined and well differentiated early experiences. Their memories, too, have less of the grotesque character. The story of hardships, wrong and suffering is deeply imprinted on many memories.

It was to be expected that the negro females would place emphasis upon dress. The racial experience also crops out. One could hardly find an Indian or white child afraid of a candy sheep's head because the teeth showed, but this was the earliest memory of a negress.

The replies to questions 4 and 5 were tabulated together with replies to questions asked persons past fifty years of age regarding the decades best and poorest remembered. The years best remembered by males of all ages are the 16th and 17th, which are equally well recalled. The 15th year comes next, followed by the 19th and 14th in the order given. The poorest remembered year is the 8th, and the second poorest the 7th. From 46 to 50 there comes a tendency to remember the last 4 years or the last decade most poorly, and the red lines representing the best remembered years, and the black lines representing the poorest remembered years mingle together. After this period, as a rule, the last 4 years, or the last decade is least remembered. There are notable exceptions, however.

A few represent the whole life, after the first 4 years, as best recalled, and know no poorest memory. The statement is made by persons past 80 that they still recall passing events well, in which they become interested, and to which they give attention. Middle aged people frequently designate the years 20-25 or 25-30 as the best remembered, for the reason that important changes were then occurring.

The poorest remembered year for the females also is the 8th, and the next poorest recalled is the 7th. Their best remembered year is the 15th. At the age of 50 the lines representing the best and poorest recalled years mingle freely, and after this the tendency is to recall the last 4 years or the last decade with the greatest difficulty. Here, too, are notable exceptions. It is worthy of note that the years poorest recalled by all persons are the 8th and 7th respectively. For all persons the years best recalled are those characterized by the great psychological and mental awakenings of adolescent life. It is true that after 50, proper names, at least, are not so well recalled. An explanation given by the returns is that middle aged people have many more acquaintances and fewer intimate friends. The early memories abate little to the last. At every period attention and interest are the handmaids of memory.

The sixth question called for false memories. The returns fully justify the discussion in a previous chapter as to the influence of dreams. There are inverted memories, and defective localization in the past is fairly common. The period 16-19 is that in which false memories are most common. The experience at this age is fairly common to both sexes, but the males are able to give fewer definite examples. Yet, while false memories are more common at this period, no time of life seems free from them.

Y. F., f., age 16. Read of robbery in paper, and told it as seen.

A. N., f., age 16. Told playmate a dream, and was punished for lying.

A. B., f., age 17. Four years ago I dreamed a person was dead, and supposed it was true until I met her a year ago.

M. C., f., age 17. Dreamed of a fire, and the next day asked if a friend went to it.

L. C., f., age 17. Dreamed that price of potatoes had gone up, that mother had told me so. Found out my mistake at the dinner table.

F. C., f., age 17. Dreamed mother had bought me a new dress. Looked for it all over the house.

M. D., f., age 19. Told teacher of a visit to Washington. Had never been there.

H. D., f., age 17. Dreamed uncle had come to visit us. Next morning asked mamma if uncle had come down to breakfast yet.

T., f., age 9. Mistook event near close of voyage home from Scotland to have been on the outward voyage.

M., f., age 17. Visited a friend five summers ago. The friend visited her seven summers ago. M. states that she made the first visit, and no amount of explanations and dates changes her mind.

T., m., age 19. Member of foot-ball team, in writing from memory a report of the games in which he played, often related events as occurring at the beginning of the game which, as a matter of fact, occurred later. This was brought to his notice by men who stood on the side lines and kept running notes of the game.

F. W., m., age 26. College graduate. Thought aunt told me something coming home from a funeral 8 or 10 years ago. Recently learned that she and I returned from the funeral in different carriages, and that it was told me by another relative.

A. F., m., age 18. Often thought I was at a feast in the woods before I was born.

R. C., m., age 15. Have an impression of having done something ages before.

C. B., m., age 17. Dreamed there was a train of cars in the closet for me, but found none.

E. L., m., age 14½. Dreamed I had a bushel of pennies, but could not find them.

A. H., m., age 19. Dreamed of landscapes which I never saw. They seemed real.

Some of the dreams may remain permanently as real, but they are apt to be corrected by experience.

Question seven called for the book read before the age of 9 which is best recalled. Books which appeal strongly to the imagination constitute a large portion of those mentioned. The influence of rhyme also apparently aids the memory. The books most frequently mentioned, 180 in all, fall under the heading of light stories and nursery rhymes. While short children's stories are included, the Mother Goose Melodies, Jack and the Beanstalk, etc., make up a large part of this heading. The younger people, especially, recall the pictured story books which they have seen in rich profusion. Here might have been placed Little Lord Fauntleroy, mentioned by 14, and Babes in the Woods, by 3.

The second division comprises novels which lead school books by the slight margin of 92 to 90. The list of novels is largely increased, however, by books mentioned separately, and which were not included in the above estimate. Such are Pilgrim's Progress remembered by 20, Black Beauty by 17, Uncle Tom's Cabin 14, Oliver Twist 3, Beautiful Joe 1, Tom Brown's School Days 1, Rip Van Winkle 3.

Fairy Tales by Grimm, Andersen and others, come next, 82, not including Cinderilla 25, Arabian Nights 5, Aesop's Fables 2, Blue Beard 8.

Returning to novels one separated from the general list is designated almost as many times as are all other novels. It is Robinson Crusoe mentioned 71 times. The Swiss Family Robinson is mentioned 25 times, Gulliver's Travels twice. Of other books Bible stories are designated by 43, didactic works by 11, biography by 14, history by 13, natural history by 16. Little Men by Miss Alcott is mentioned by 9, and Little Women by

16. A middle aged man writes that he recalls Little Men better than any book he has ever read. Essays are mentioned by 3, Moody and Sankey Hymn Book by 1. The Scrap Book and Brownies have one vote each. Peck's Bad Boy is mentioned twice.

The pedagogical significance is unmistakable. What appeals to the child's imagination interests him, and as a result remains in memory. Historical and didactic novels are most potent of the permanent influences. Scott and Lord Lytton, not mentioned here, if read early will be remembered. The Bible stories are the portions of sacred Scripture best suited to the child. Biography is well remembered and most instructive. There could be no better reading to appeal to the permanent interest of the young, than some of the best of Jowett's Dialogues of Plato.

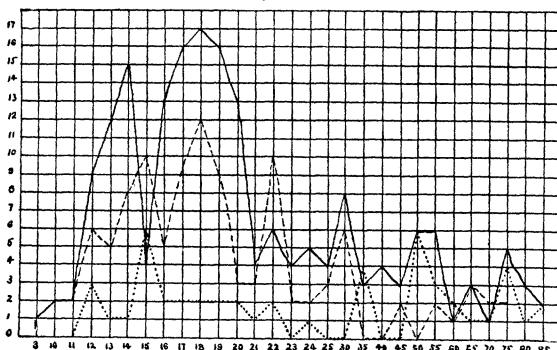
#### PLEASANT AND UNPLEASANT MEMORIES.

"The thought of our past lives in me doth breed perpetual benediction."

A large number of replies were received to the inquiry, "do you remember pleasant or unpleasant experiences better?" The replies are illustrated by the curves here given.

The figures at the bottom give the age of the persons interviewed; the height of the curves gives the relative number of replies; the heavy lines representing those who remember the pleasant better, the broken lines those who remember the unpleasant better, and the dotted lines the number who could make no choice. It is the relative rise of the curves representing the pleasant and unpleasant memories, and not the absolute rise of one at any point or points that is significant.

Fig. III.



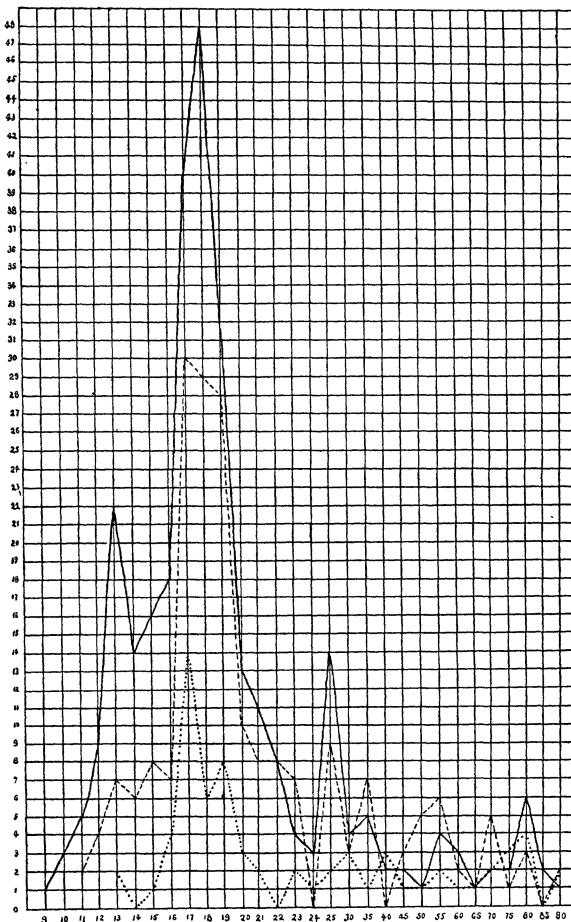
Curves representing the pleasant and unpleasant memories of white males.

As will be seen the pleasant and unpleasant memories of the male whites rise and fall together until the age of 21. At 22,

in the case of the males, the curve for unpleasant memories is the higher, after which the pleasant memories are in the ascendancy. After the age of 30, unpleasant memories are little recalled by the males.

The unpleasant memories have a larger share in the woman's mental life than in that of the man.

Fig. IV.

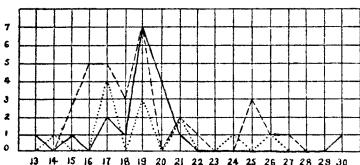


Curves representing the pleasant and unpleasant memories of white females.

The unpleasant memories play the important rôle in the case of the Indian and Negro males. One can hardly fail to see in it a suggestion of persecution and slavery. The Indian females show a slight tendency toward remembering unpleasant expe-

riences best, and share the sorrowful experiences of their

Fig. V.



Curves representing the pleasant and unpleasant memories of Indian males, | Curves representing the pleasant and unpleasant memories of Indian females.

brothers. On the other hand, in the case of the negro females, unpleasant experiences play a very minor part indeed. With them a dress of striking color appears easily to efface grief.

Fig. VI.

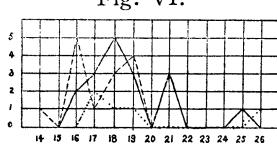
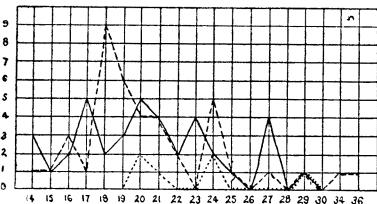
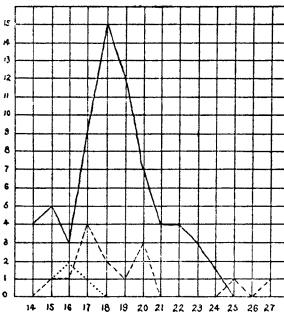


Fig. VII.



Curves representing the pleasant and unpleasant memories of Negro males, | Curves representing the pleasant and unpleasant memories of Negro females.

For many years the warning against memoriter work has been so persistent that one almost feels like apologizing for asking the question—"what studies have best developed your memory?" The thesis that memory ought not to be trained has been supplemented by the other that it cannot be trained. These ideas have made for advancement. They have also wrought injury. Have college students the ability to-day that they had fifteen years ago, to reproduce an author's thought and to think while upon their feet? The question in the topical syllabus called forth a great number of replies. Almost all of the studies in the curricula of High Schools, Normal Schools and Colleges are mentioned. We must allow for the fact that studies most commonly pursued will be mentioned most frequently. History easily takes the precedence, being mentioned 229 times. Some specify learning the dates, but with the great majority the work of fixing the salient points at different epochs, and wide collateral reading, are believed to have aided the memory. It is but natural that a close ally, geography, should come next. It is mentioned 147 times. Arithmetic comes next, having 124 votes. Many specify the committing



of the rules and tables. The tables for denominative numbers form an admirable memory drill. Geometry is mentioned 66 times, and algebra 27 times, while mathematics is mentioned 55 times. In certain schools where mathematics are well taught they have a large percentage of votes. Latin is mentioned 67 times, some add "when taught in the old way." No other language is to be compared with the Latin in the number of its adherents, although Greek is mentioned 8 times, (many more have studied Latin than Greek). French 7 times, German twice, and Language by 19. If this be true of foreign languages we are not surprised to find that English Literature has 74 votes, English grammar 47, poetry 45, general reading 36, recitations and declamations 30. Many state that their memory has been improved by memorizing gems of literature. Spelling is mentioned 27 times, science (general science) is mentioned; chemistry and physics are each named 5 times, physiology 14 times, botany twice, and zoölogy three times. Music is mentioned 8 times. Other studies named are Moral Philosophy 1, Psychology 11, Drawing 1, Catechism 3, Bible verses 9, Pedagogy 1, Political Economy and Civil Government 1 each. The Indians mention short-hand and phonography as helpful in training the memory. They also give other studies mentioned by the whites. The negroes, with two exceptions, refer to text-books and other books mentioned by the whites. It is probably true, as stated in another chapter, that nature assigns memory limits to each individual. There is as little doubt that within the limits assigned by nature the memory is susceptible to training, and is developed more by some studies than by others.

The request contained under heading 10 of the syllabus—"give a condensed account of any case of loss of memory caused by a blow on the head, a fall, or by disease," elicited a number of suggestive replies. These results are not significant as compared with the carefully collated results in chapter 3, studied under medical supervision. They show, however, that loss of memory due to traumatism and disease are fairly common and carefully observed by the folk consciousness. Instances given are as follows:

I. J., m. Head injured during foot-ball game. Could not remember signals.

Grandmother in usual health lost all memory for  $1\frac{1}{2}$  days.

M., f. Suffered nervous prostration, had to learn A. B. C.'s over. She afterward became a High School teacher, but was forgetful.

E. G., f., age 19. Crossing the ocean forgot all had learned. It came back at age of 15.

M., f., age  $7\frac{1}{2}$ . Broke arm. Next day asked why it was tied up. Had forgotten the name of the pussy cat, etc.

B., age 8. Scarlet fever, forgot everything, and had to learn over.

A number of instances were given in which the secondary automatic movements of children were lost by disease.

E., m., age 2. After a fever he had to learn to walk over again.

Man fell. He did not know his own name for 2 years. After the death of his wife it all came back to him.

Man fairly educated, after typhoid fever had to learn to spell.

M. W. Fell down stairs three years ago. Cannot remember names since, nor can he identify persons.

F. Can recall nothing which transpired before an illness at 6.

Child fell from barn. Forgot being on the barn.

Quinine affects the memory of one.

L. L., f., age 15. Crossed Pacific Ocean at 4, sick, forgot Chinese language. It came back upon return to China 2 years later.

That the memory is affected by the state of the physical health is a widespread, popular belief, due to experience. A "close, stuffy room," and "lack of mental power due to fatigue," are mentioned as prejudicial to a good memory.

E. M., f., age 18. Broke limb at 9, took chloroform. Memory for years 1-9 poorer since. She attributes it to the chloroform. Others believe that chloroform has affected their memory.

H. K., Indian, age 24. "I was playing foot-ball, and once while running with the ball I was tackled by an opponent, who threw me on the flat of my back, with his own weight on top of me, my head striking the ground at the same time or a little before my body did. I got up in a little while, said I was not hurt for I felt no pain, so they began playing. They called the signals and I stood still. I could not place the meaning of the numbers. I did not even know my own number, so after the play was made I stepped to the other 'half-back' and asked him what my number was. Before the fall I knew the signals as well as any man on the team. Of course I had to retire from the field. I could not remember from one minute to the next. I knew what I was doing, and knew at the time that I could not remember anything. There were three days that I could not remember anything. It just seemed that a door would shut on everything I did, and in less than a minute I would be doing the same thing over again."

A well known pedagogical principle is that vivid impressions are easily recalled. With frequency, recency, and emotional congruity, vividness plays an important rôle in association. In order to test the abiding character of a vivid experience 179 middle aged and aged people were asked in personal interviews the following question: "Do you recall where you were when you heard that Lincoln was shot?" An affirmative answer required the exact location, an example of which is the following reply: "My father and I were on the road to A—in the State of Maine to purchase the 'fixings' needed for my graduation. When we were driving down a steep hill into the city we felt that something was wrong. Everybody looked so sad, and there was such terrible excitement that my father stopped his horse, and leaning from the carriage called: 'What is it, my friends? What has happened?' 'Haven't you heard?' was the reply—'Lincoln has been assassinated.' The lines fell from my father's limp hands, and with tears streaming from his eyes he

sat as one bereft of motion. We were far from home, and much must be done, so he rallied after a time, and we finished our work as well as our heavy hearts would allow."

Not all the replies were so vivid as this one, but only those were accounted as affirmative which contained facts as to time of day, exact location, and who told them.

J. P., age 76. I was standing by the stove getting dinner, my husband came in and told me.

M. B., age 79. I was setting out a rose bush by the door. My husband came in the yard and told me. It was about 11 o'clock A. M.

H. R., age 73. We were eating dinner. No one ate much after we heard of it.

J. T., age 73. I was fixing fence, can go within a rod of the place where I stood. Mr. W. came along and told me. It was 9 or 10 o'clock in the morning.

L. B., age 84. It was in the forenoon; we were at work on the road by K.'s mills; a man driving past told us.

Of the 179 persons interviewed, 127 replied in the affirmative, and were able to give full particulars; 52 replied in the negative. A few who gave a negative reply recalled where they were when they heard of Garfield's death. Inasmuch as 33 years have elapsed since Lincoln's death the number who made an affirmative reply must be considered large, and bears testimony to the abiding character of vivid experiences.

Many helpful pedagogical suggestions were received from High School, Normal and College students in reply to question 11. Figures are mentally represented as clearly as possible,—a "picture of them as they look printed or written." A child thought of the figures to be carried in division as "gone up in the attic." He would "call up attic to see if anything was there." One "locates them on a certain page of a book." Several "write them a few times." Association helps. A college student writes, "I associate figures with what is familiar. If I hear that Mr. A. receives \$5,000 salary, I say to myself that is 5 times as much as my old school teacher got. After this the salary is easily recalled." Place localization, and association are chiefly relied upon. Some have a kind of mnemonic system, and group or reverse the numbers. One associates the figure 8 with a doughnut.  $3.1416$ , the ratio between the diameter and the circumference of a circle is fixed by serial association, repeating the figures in order. 3.—1.4.1.6. (3, one 4, one 6). The same aids are employed for dimensions. The most efficient mnemonic aids for dates is to associate them with important events, *e. g.*, 1492, 1776, etc. Dates of minor importance are associated with these. Charts are recommended. Some make rhymes for dates, getting the idea, perhaps, from the way the presidents or the rulers of England are remembered. One sees figures in a winding row.

Faces are recalled by types. After fixing the type to which it belongs, the eyes, hair, nose, cheek-bones, complexion and scars are noted. A college student writes: "I try to trace a resemblance between a strange face and one I know." A middle aged woman takes careful notice of the hand. She has a poor memory for faces, but can often locate the person by the hand. A normal student writes the initial of the person or place on the left hand. After it has been erased she still visualizes it there. One analyzes the features. "If any feature resembles a well known face it is easily recalled."

Microscopic structures and crystals are fixed by drawing them. Drawing is the chief aid. Here, too, clear visualization counts. "I see them floating before my eyes." Localization in place is a help.

Leaves are remembered by the form, color, number of lobes, the veining, margins, and by comparing them with other leaves. Figures of wall-paper and carpets are associated with the room, house, or are localized in time. Here forms are also fixed by drawing, "even by tracing them in the air." The color, shape, and above all striking characteristics of figures are noticed.

Phrases in music are recalled by playing, or by attempting to play, or by humming the tune. College student, m., age 22. "I recall the time intervals and note the first part of the theme; I recall the rest by association." Female, age 17, normal student writes: "I remember phrases in music by thinking if they are similar to phrases in any selections that I have heard." Constant repetition and association of the selection with the person who played or sang it are helps frequently used. "If I get one measure as tone,—be it first or last,—the rest comes without effort." Female, age 34, recalls sounds, not appearance of notes. Her memory for sounds was strengthened by taking music lessons. One recalls music by an imaginary curved line going up and down with the tone. One thinks of whole rests as heavier than half rests, and consequently falling below the line. One boy thinks of the notes as Chinese climbing a fence. With another it is secondary automatic,—"my fingers remember the music." The Indians find that sheer determination helps them to remember music, as other experiences.

The negro males gave,—by sound, visualizing, position of notes on the staff, some initial note is the key to the whole, music just comes up. Negro females remember (a) phrases in music by accent, (b) by sounds, time and words, (c) where they saw them last, (d) by mental picture of the notes. The familiar mnemonic sentences are given for sharps, flats and keys: "God deluged all earth by floods," "Foolish boys eat

apple dumplings greedily," "Fred Coburn goes down after each boy."

It is worthy of note that some excellent musicians recall music better after an interval. They cannot immediately reproduce it if they have enjoyed it intensely. Sometimes an interval of a day or two is necessary in order to recall it well. It is quite possible that there is a modification of the basilar membrane which serves as a basis for subsequent recall. Furthermore it is true that many people find that a time interval is necessary to recall well any experience. E. C., f., age 17, recalls better now what happened in all school grades than when she was younger. Male, age 20, "I can define and locate my former experiences better now than I could a year or so after they happened." Female, age 19, "I can recall now things that happened 8 or 10 years ago, which I could not recall 4 years ago." Apart from a maturer mind perspective seems to be necessary to many in order that they may have a good memory.

The cut of dresses is recalled by association with the person who wore the garment. New features are noted. The different parts, as neck, yoke and skirt, are studied by one. Association with place and person is the chief aid.

Passages of prose and declamations are memorized by paying attention to the thought. After the thought is fixed it easily clothes itself in language. Not a few, however, memorize mechanically, attention being especially paid to the beginnings and endings of sentences. Repetition and reading aloud are frequently mentioned. Clear mental representation and a purely local memory are of service. Male, 17. "I usually memorize by imprinting the object and its surroundings on my mind like a negative. In memorizing Lew Wallace's "chariot race," comprising 16 pages, I read it through twelve times. I imprinted the photograph of the page on my mind, and then read what I saw." In poetry the answers bear out the conclusions of Ebbinghaus and Müller and Schuman, as to the influence of rhythm. It plays the chief rôle. One is aided by fixing upon the initial letters of each line. Another gets the thought, "and the words which are so closely associated with thought in poetry come of their own accord." Repeating aloud is of service, but form and structure are usually mentioned as the essentials to be considered. Practice improves. One learns easily who memorizes a selection every day and rehearses all at the close of the week. A college student writes, "first of all a feeling of confidence is necessary in all recollection. Doubt breaks the train." The memory must be trusted.

Much the same suggestions are given as to the manner of memorizing fine passages. Slow repetition aids one or two.

The reasons given for memorizing these passages are (a) beauty of thought, (b) beauty of expression. "The author expresses the thought better than I can." "When depressed these beautiful passages come up and encourage me." Other reasons are: "To enrich my mental life," "prevents day-dreaming," "convenient when no book is at hand," "for pleasure and enjoyment" is an answer repeated frequently.

Few devices were given for fixing forms and phrases of foreign languages. Comparison with similar phrases and forms in the mother tongue is found to be serviceable. Even where the native language is as poor as the Indian this device is found useful. The less familiar are associated with the better known. The beginning of the list of German prepositions, aus, bei, mit, nach, etc., are associated by one with the phrase "the house by the meat-market."

A large number of devices are given for keeping appointments. Females change rings, insert paper under a ring, pin paper on dress, etc. There are other favorite mechanical devices. Chairs are turned over, and other furniture disarranged. A middle aged man hid his hat to remind him of an appointment. Next morning he hunted up another hat, but did not recall why the one usually worn was gone. One associates appointments with the hands of the clock at the hour fixed. Not a few find it necessary to repeat the appointment again and again. Others are aided by a memorandum. As a rule those who say that their memories are utterly untrustworthy do not use notes. Yet W., m., age 26, writes that the only appointment he has missed for years is one which he noted down. Female, age 16, writes, "to keep an appointment I write the first letter of the person or place connected with the appointment on my left hand. Even if it be erased I still imagine it there." Clear mental representation is the great help in such cases. Three visualize in colored terms. Female, age 19, recalls the letter A in black on red background. Female, age 21, "words seem colored. My name is red, my sister is yellow. I often remember by color." Male, age 18, "I remember figures by color."

There is a wide diversity of opinion as to how full notes a student should take, and almost all degrees of copiousness are indicated. Female, age 37, believes her memory was injured by taking full notes at the normal school. Again, "too many notes make the general idea of the lecture indistinct." One writes that the state of his health determines how full notes he takes. If the physical tone is low he is obliged to take more copious notes. Some are best aided by jotting down the headings and by giving attention unreservedly to the lecture. A normal student writes out very full notes, and never thinks

of the contents of the lecture until she leaves the lecture room. Some take "key" words with which the rest is associated. Concentration of attention and "hand and arm" memory are required as a rule by taking quite copious notes. To take few notes is a work of art, and the essentials must be seized upon. The consensus of opinions received would seem to favor few notes. Where full notes are taken they are not often reviewed.

The inquiry: "how would you teach a boy to remember things on time?" brought out a large number of specific directions, many of which were of a nature to make the fate of the lone Indian attractive by comparison. The normal students would have him keep a memorandum book; deprive of some pleasures, give tardy mark; keep after school as long as late; exclude from class and association with other pupils; if late at dinner, give very scanty meal; write down and fix things for him to do in a natural order; mark o; be on time myself for an example; make him go and get what he had forgotten; tell him true story of boy in trouble on account of forgetfulness; punish if late, and reward for being on time; make him do two or three times as much when he wants to do something else; study the boy; exclude from school; make him write the thing forgotten 20 times; have him repeat what he was to do and when; make him take the natural consequences; whip; lecture; strengthen his memory by having him commit poetry; have him write several hundred times what he had forgotten; give him tasks to perform that could be done only at one time; teach the sin of forgetting; try to interest him; first, ask why, second, keep after school; strengthen his memory by giving him short lessons to learn; show him how it would affect his father's business if his father were not on time; "I once told a forgetful boy to be sure and forget, and if he did I would give him a pretty card. He remembered."

The academic and collegiate students favor corporal punishment. One states that it worked well when he was a boy. The Indians also suggest this remedy. A very sensible suggestion comes from a college woman: "If a boy could not remember things on time, I would try to give him opportunities for practice; I should try to form an association between the thing to be done and the required time or something which would happen then." The suggestions to study the boy, and make him take the natural consequences; try to interest him; and ask him why, are good from a pedagogical standpoint.

A large number of young people state that they store up facts and dates with no definite idea of how they will use them. This statement applies more to facts than dates. It is a trait more characteristic of young men than young women. Male,

age 20, writes: "I collect facts as I would dollars, expecting to use them in many different ways." While peering into the future, and uncertain as to what resources shall be called out, the young man stores up facts from all sources, with but little thought as to their use.

In reply to question 12, instances are frequently given of a tenacious memory for history or literature, accompanied by little ability for original thought. Such students are usually deficient in mathematical ability. One young girl learns a page easily, but she has to recite it in order, or all is a blank to her. Male, age 19. Recalled all that he heard or read, but his conversation and writings were masses of quotations.

On the one hand it is recognized that a rich mental life is impossible without a good memory; on the other, very complete association is often attended by poor constructive power.

The request made under heading 13 of the syllabus called forth a wealth of material. Certain cases due to abstraction are as follows: A young lady went to telegraph for an umbrella left on a car; she had been holding it over her head for 30 minutes. A lady walked into the parlor with a \$10 bill in one hand, a match in the other. She put the bill in the stove and saved the match. A college professor forgets to eat his meals. A boy broke his ribs, and forgot all about it in two days. A man picked up a pebble and put it in his pocket; took out his watch and threw it into the ocean. A lady tried to tie her horse with the blanket and cover him with the line. A boy returned from the store three times to find out what his mother wanted. A lady was called away by an important message before breakfast, forgot until late in the day that she had eaten neither breakfast nor dinner. Gentleman, age 50, came down from his study and asked his wife if she knew where his pen was, he thought the children had mislaid it. She told him if he would take it out of his mouth he would talk more plainly. Boy, age 9, sent to store for extract of peppermint, brought paregoric; sent back with a bottle labelled peppermint, brought vanilla; third time sent he brought the peppermint. College professor, expert in numbers, is frequently seen with one black and one tan shoe on. A minister became absorbed in a book and forgot that it was Sunday. Man walked home and left his horse in the village all night. The same man went home from church and left his wife.

A great share of cases of lack of memory are due to abstraction, or to absent mindedness, which Mach terms "present mindedness." It often characterizes people of great ability along narrow lines of thought. The following is an instance of lack of memory due to fatigue: Female, age 22. "At the age of 16 I had been travelling all day, I went to the ticket

office at the last change of cars, but could not think where I was going, yet I had lived in the town 16 years.

There are a few instances given in which loss of memory is due to distraction. A middle aged woman heard of her son's death by drowning. She could not remember her husband's address in order to telegraph him, although she had written there hundreds of times. "Aunt recalls nothing that happens since her husband's death."

Defective memory in children is ascribed to things known. There are many instances reported in which forgetting occurred in the field of things done, many of these cases, however, are evidently cases of temporary forgetfulness due to abstraction. All of the Indians, with a single exception, state that things known are most easily forgotten. As to abstraction, no period of life is free from its influence. Not a few draw comfort from the facts frequently cited, that Samuel Johnson, when he had stepped from the sidewalk would continue for a long distance with one foot in the gutter and one on the walk; that Pestalozzi did not know enough to put up his umbrella when it rained; that Sir Isaac Newton supposed he had eaten when he saw the chicken bones on his plate; and that Edison forgot his wedding day. Still the fact remains that no period of life is free from noticeable abstraction. The boy with book in hand forgets to go to dinner after he has rung the bell; the young woman goes to different parts of the house, she knows not why; middle age hunts for the thimble on its finger, or the pen in its mouth; while old age is troubled that it cannot find the glasses on its nose.

Loss of mind and heredity are much less frequently cited as causes of forgetfulness than abstraction or distraction due to disease.

The fourteenth question was very abstract, and in some instances was evidently misunderstood. The answers came chiefly from young people. Of those who apparently answered in an intelligent manner 140 believed that the interval between being aware of an experience and the ability to define, locate and name the experience grows narrower as we grow old. Often the period up to middle age only is considered. One qualifies the statement "until old age;" two state that this is true until college is reached; while many consider that it holds until middle age. Not a few of the replies are the outgrowth of individual experiences, and would not apply after the age of 20 or 22 is reached. 125 state that the interval grows wider. Several state that this is especially true of middle age. The fact is recognized in the returns that the interests of middle life are greater, and the range of one's acquaintances is wider, and that this influences the interval necessary for recognizing and

defining an experience. This may not be the only factor, but it seems to offer, at least, a partial explanation. A fruitful field of inquiry is thus opened up and the ground broken. Prolonged and painstaking study of this problem may be richly repaid.

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